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ANTARCTICA: OPERATIONAL CONCERNS FOR THE 21ST CENTURY

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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The Antarctic Region has received very little attention from either national or military leaders since the late 1950's. The reason for this is that the Antarctic Treaty signed in 1961 has been able to provide a means for continued stability and security in the region. It has been a treaty whose success has been made possible by a rare consensus of the national interests of nations involved in the region. This consensus, however, is coming under more and more pressure as nations reassess their interests in light of the effective end of the Cold War. Emerging nations are becoming more assertive and better able to contend for what they see as their share of the world's resources. The future disposition of the Antarctic with its unresolved sovereignty and its resource potential will eventually become a contentious issue. Conflict in this region over sovereignty or regional influence would threaten U.S. national security interests and could require a military response. The employment of military force in the Antarctic would, however, be extremely difficult due to

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PREFACE

The intent of this paper is to demonstrate a pressing requirement for contingency planning in the Antarctic Region. In developing this paper, my belief was that it was important to develop two themes in support of the thesis. Since this region is not well-known, especially to planners at the CINC level, the first thing needed was to identify the United States' national security interests in the region and emphasize those that could be threatened by the use of force. By doing this, the potential for military action in support of these interests would be established. To support the need for deliberate planning verses crisis action planning, a broad examination of some of the sever operational constraints associated with this region was analyzed.

While the operational aspects may be more important in the actual planning of contingency operations, I considered it essential to establish the importance and the vulnerability of the region as well. Both themes are equally important in presenting a balanced position for consideration at the Theater CINC level.

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ANTARCTICA: OPERATIONAL CONCERNS FOR THE 21st CENTURY

CHAPTER I

INTRODUCTION

Lost in the shadows of the spectacular events of the past several years is this year's 30th Anniversary of the Antarctic Treaty. The significance of this anniversary is that the Treaty is now eligible for review and revision if one of the signatories so requests. While this Treaty has served to manage the Antarctic region in a peaceful and mutually satisfactory manner to all concerned, this can no longer be taken for granted. In an increasingly multipolar world, geopolitics will be influenced by a much larger range of competing national interests than was the case in a bipolar world. Emerging nations as well as established powers will play significant roles in determining the outcome of international events. Competition for influence and resources will become more intense as each nation moves to satisfy their interests and objectives.

With the vast majority of the earth already claimed and occupied, this competition is bound to turn toward those areas considered common domain or for which sovereignty claims remain unresolved. Antarctic, as the last largely unoccupied continent and whose sovereignty remains an open issue, will ultimately become one of the objects of that competition. It would be folly to believe that his competition will always be peaceful and that all future disputes will be resolved without resorting to force. If Antarctica lives up to any of its potential as a source for natural resources and if future technology allows the exploitation of those resources, disputes will

inevitably arise. While the U.S. has remained active in treaty matters and scientific research, political and military leaders have not recognized the potential impact of conflict in the Antarctic region on national security interests. There is no reference made to this region in either the 1990 National Security Strategy of the United States or in the 1990 Joint Military Net Assessment. There is no indication in any open literature that any of the Commanders-in-Chief actively plan or have existing plans for operations in the Antarctic region.

This paper takes the position that there is a requirement for military planners to develop contingency plans to support U.S. national security interests in the Antarctic region. In order to support this thesis, this paper will explore the national security interests of the U.S. in the Antarctic region, the threats to these interests and some operational constraints and considerations that would require detailed contingency planning well in advance of any operations conducted in the region.

CHAPTER II

BACKGROUND

Since the early expeditions into Antarctica, a great deal of exploration and the subsequent establishment of scientific bases has taken place. Currently 12 countries maintain 46 permanent or part-time stations in the Antarctic.1 The significance of the explorations and bases is that they form part of the basis for sovereignty claims by the seven nations that claim parts of Antarctica and serve as a potential basis for countries that for one reason or the other may decide to make claims.

That the region has remained for the most part peaceful is due in large to the Antarctic Treaty that was put into effect in 1961. This Treaty grew out of the rising tensions between the United States and the USSR in the early and middle 1950's. In an effort to prevent this tension from spilling over into Antarctica, preliminary negotiations were conducted during the International Geophysical Year (1957-58) to reserve the region for peaceful purposes only.2 Since its ratification in 1961, Treaty membership has grown from 12 to 38 countries. Currently, 24 nations have consultative party status which confers voting privileges concerning the Treaty Regime and 14 nations are non-consultative parties with no voting rights. 3 Based on the sheer number of nations involved in Antarctica, it becomes evident that the potential for disputes over sovereignty and resource distribution exist.

The original Antarctic Treaty contains 14 articles. Within these 14 articles are five important points: (1) the region is demilitarized; no

military operations are allowed although military support for research is permitted, (2) nuclear testing and waste disposal is prohibited, (3) sovereignty claims are frozen for the life of the Treaty. This provision does not specifically recognize nor deny any of the present claims and it prevents any further claims by any nation. (4) Access to the entire continent for scientific work is guaranteed, and (5) a unilateral inspection system to ensure compliance with the Treaty was established. The original Antarctic Treaty is now the center of a series of agreements concerning the region, known as the Antarctic Treaty System. Other agreements include the Convention for the Conservation of Antarctic Seals and the Convention for the Conservation of Antarctic Marine Living Resources. 4 Just recently, a Convention for Antarctic Minerals was vetoed by two of the consultive parties. 5

The Treaty has worked well during its 30 years of existence. Whether or not any of the consultive parties will call for a review of the Treaty in 1991 remains to be seen. Certainly in making a decision to review the Treaty or to let it stand, each nation will examine the provisions of the Treaty in light of their current and future national interests.

CHAPTER III

U.S. NATIONAL SECURITY INTERESTS IN THE ANTARCTIC REGION

National interests naturally dominate all U.S. policy formulation and subsequent planning for any region of earth. To identify what national security interests may be present or effected by events in Antarctica, this chapter will examine four general areas of national security interests and identify the threats to them.

Political/Diplomatic

The two most important interests of the United States in the Antarctic region are the maintenance of stability and retaining influence in the region. As in other regions, stability and influence are important here to avoid conflicts that could in turn become the source of regional wars. Maintaining stability and influence in a region that is becoming of more and more interest to the entire world (witness the growth of the Antarctic Treaty System from the original 12 members to 38 current members) will become an increasingly more difficult political and diplomatic task.1 For the United States, this means maintaining and strengthening the Antarctic Treaty System.

The most likely threat to the Antarctic Treaty and regional stability lies in conflict over the sovereignty claims made by Norway, Australia, New Zealand, Chile, Argentina, France, and Britain. This threat could take several forms. Since these claims are not recognized by the remaining nations of the world, conflict over access both to the continent itself and any exploitable resources could occur between the claimants and non-claimant nations.2

Another threat is the possibility of conflict between nations with overlapping sovereignty claims as is the case between Britain, Chile and Argentina. In this case, all three claims overlap each other in the area of the Palmer Peninsula. None of the three recognize the claims of the other although Chile and Argentina have agreed to recognize each other's interests. 3 None of these nations enjoy particularly good relations with each other. Britain and Argentina remain at odds over the Falklands and, Argentina and Chile have other conflicting claims over islands in the Beagle Channel. The potential for trouble is greatest on Deception Island where all three maintain stations almost within sight of each other. While no fighting has taken place, diplomatic notes are exchanged with some regularity. 4 Any attempt by any one of the three to upgrade their sovereignty claim would be seen as a threat by the other two and could lead to conflict.

An equally destabilizing possibility and a major threat to U.S. influence is the formation of coalitions or alliances that would seek to control the area. This could originate among those nations with existing territorial claims in order to consolidate these claims or among those nations without claims that do not want to forfeit the potential profits from the region.

One opposing set of alliances has already posed some threat to the stability of the region. This alliance was one of industrialized verses non-industrialized nations. During negotiations over a mineral convention, Brazil, India, China and Uruguay demanded concessionary rights in the form of technology transfer and mandatory participation in joint mining

ventures. This was opposed by the U.S., France, Britain, Germany, and Japan. This type of polarization is likely to become more frequent in the future. 5

The coalition that could most truly threaten U.S. national security interests would be one of several or all the South American nations. With their geographical advantage, a coalition of South American nations with stated interests in Antarctica (Peru, Brazil, Uruguay, Chile, Argentina and Ecuador) would be in an excellent position to control the region. South America has long considered Antarctica a "dagger pointed at its underbelly" and has strong interest in protecting its southern flank.6

Economic

U.S. economic interests in this region center primarily on the potential existence of various natural resources and the future technology to exploit them. An an industrialized nation, the United States will have to remain in the forefront of competition for natural resources. This competition will become more intense as the world's emerging nations in Asia, Africa and South America join the competition.

Antarctica holds potential promise in several resource areas:

1. Water. Antarctica contains 75% of the world's fresh water. Several ideas have been promoted to tow icebergs to those areas that are habitually afflicted by drought. Saudi Arabia is one country that has looked at this as a possible solution to its water problem. While this has not yet proved feasible due to the long distance from Antarctica to the Middle East, efforts to supply two other areas that badly need water, Northern Chile and Southern Peru, may prove to be more feasible.7

2. Food. The Antarctic waters are rich with marine life. Sealers, whalers, and fishermen have worked these waters for centuries. While none of these have the potential to feed the many hungry people of the world, the harvesting of krill may. Krill is a small mini-shrimp that abounds in Antarctic waters. Currently, it is caught primarily by the Soviets and the Japanese and is used as supplementary food for livestock.8 It is reasonable to expect, however, that increasing demand for large amounts of protein will help to resolve the technical problems that currently limit its use.

3. Oil. Some estimates have placed the amount of oil reserves in the offshore continental self of Antarctica at 45 billion barrels. 9 If even a portion of this claim proves to be true and, if the technology to exploit it is developed [the constant motion of the pack ice makes conventional drilling rigs unsuitable], this region's importance will increase geometrically. Oil drilling is strongly opposed by environmental groups who fear damage to the environment in the event of a large spill or oil rig accident. Most significantly, it remains uneconomic at the present to try to extract oil from this region. If there was a significant rise in oil prices, this could change.

4. Mineral Resources. Hard evidence exists of the presence of several important minerals in Antarctica. On the Antarctic Peninsula, copper and molybdenum have been found. Significant amounts of coal and iron ore have been located as well. Parts of Antarctica are geologically similar to others around the world where such minerals as chromium, platinum, copper and nickel are found in mineable quantities. 10 The commercial development of these minerals will prove to be technologically

difficult due to Antarctica's harsh environment. However, as with the oil if certain minerals become scarce, it may become economical to try to extract them. Commercial mineral development has also been strongly opposed by environmental groups and all attempts by the Antarctic Treaty System members to develop a Minerals Convention has failed.11

Economic expansionism throughout the world offers the greatest threat to U.S. economic security interests in the region. As developing nations become more industrialized, the competition for natural resources will intensify. There can be little doubt that these nations recognize the potential of this region. In the most recent meeting of Antarctic Treaty System in November, 1990, the idea of making Antarctica a "World Park" was endorsed in one form or the other by all the delegations except Japan, South Korea and Britain. 12 Although unstated, it is clear that these nations do not want obstacles erected that could prevent their future activities in the region. It is very unlikely that as natural resources become increasingly scarce, nations will put aside their economic interests for aesthetic ones.

Another economic threat lies closer to home. With the shrinking budget and an expected focus on domestic problems, resources for further Antarctic activities could become hard to find. Any pull back in the region could damage U.S. credibility and place at risk future U.S. sovereignty claims which could in turn encourage adventurism in other nations.

Scientific

The Antarctica has proved to be an extremely valuable laboratory for scientific research. The U.S. has been in the forefront of this research

and currently maintains six scientific stations on the continent, four of which are open year around. 13 Maintaining freedom of research is extremely important. Studies on the physics of the upper atmosphere are best conducted in the Antarctic. This is due to a natural low radio frequency noise level and minimal changes in elevation of the sun above or below the horizon. 14 Additionally, meteorological and oceanographic studies have been underway since the early explorations of Scott and Byrd. Best known are the studies concerning the ozone layer and the warming of the earth's climate that are being actively pursued at McMurdo Station. 15 Access to Antarctica to continue this research is critical but equally so is the preservation of the Antarctica's environmental purity which is necessary to maintain the scientific base line.16

Access could be threatened by any attempt to enforce sovereignty claims. Currently, the Antarctic Treaty guarantees free access to the entire continent for scientific research. Of the six U.S. Stations, four fall within the sovereignty claims of the seven claimants. Two fall within the conflicting claims of Argentina, Chile and Britain.

The second threat to scientific research - environmental damage - would most likely arise from unregulated attempts to develop oil or mineral resources. Pollution from these activities could destroy the purity of the region. Jacques Cousteau has outlined several scenarios involving mining and oil drilling that could adversely affect the continent and destroy its value as a scientific base. 17

Military

Antarctic military importance to the U.S. lies in its geolocation and

in the continued nonmilitarization of the region as set forth in the Antarctic Treaty.

The Palmer Peninsula, along with the tip of South America, sits astride the Drake Passage. This Passage has proven to be strategically important in past wars. In World War I, the German Pacific Squadron was intercepted and sunk by the British in these waters. In World War II, German Commerce Raiders operating out of Antarctic waters sunk some 193,000 tons of allied shipping before the British could effectively stop them. 18

The significance of the Drake Passage today is tied to the Panama and Suez Canals and the sea lines of communication that run through or near the region. Closure of either of the canals would greatly increase the traffic through the Passage. Especially important to the U.S. would be any disruption of the Panama Canal. With a two ocean commitment, the U.S. must be able to move naval units from one coast to the other. War ships forced to use the Drake Passage would be subject to interdiction by forces operating out of the Antarctic. In a time of tension or outright conflict, control of this choke point would become extremely important. Additionally, some of the Navy's capital ships, due to their size, can not use the Panama Canal for transit, requiring free passage through the Drake Passage regardless of the availability of the canal.

Another significant factor is the capability of forces based in the Antarctic to interdict commercial shipping following the Southern Hemisphere's sea lines of communication. This could have serious impact on the United States' war making ability since so many of the critical strategic raw minerals must be imported (66 of 77). 19

Of further potential military interest in the area is the possible need to evacuate U.S. personnel from the region in times of tension or conflict. There are a number of U.S. personnel, both scientists and more recently tourists, in the Antarctic at any given time. 20 The need to evacuate these people would present serious obstacles due to the distance from the United States and the environmental conditions of Antarctica.

Finally, the threat of eco-terrorism cannot be ignored. Incidents between organizations such as Greenpeace and U.S. forces have not been uncommon over the last few years. Attacks on Antarctic stations perceived to be working on military or commercial research cannot be totally ruled out.

The second major U.S. military interest - continued nonmilitarization of the region - is required by the Antarctic Treaty. It prohibits the establishment of military bases, fortifications, military maneuvers and the testing of weapons. This applies to all areas south of 60 ^{o} south latitude. This is the cornerstone of the Antarctic Treaty whose primary purpose was to preserve the region for peaceful purposes only.

Nonmilitarization works only as long as all parties to the Treaty comply with it. Any perception of non-compliance could cause the entire structure to collapse and precipitate a build-up of arms in the region. There have already been at least one allegation of a violation of this provision. In this unsubstantiated allegation, New Zealand accused the U.S. of military improprieties to include testing low frequency radio transmissions for submarine navigation, research on geomagnetic effects on missile guidance and low temperature basic military training. 21 While unproven, a perception by other nations of any such actions could be very

destabilizing. Any militarization in the region is sure to bring a response by claimant nations to protect their sovereignty claims.

Nonmilitarization in the region, while mandated by treaty, remains extremely fragile. The balance of power it represents could easily be disrupted by sovereignty disputes or disputes over the rights to natural resources. World-wide arms proliferation is providing the means to many developing countries to intervene in the region with enough power to place at risk U.S. national security interests.

Both Argentina and Chile, for instance, are involved in modernization programs for their navies. Argentina is building three new diesel submarines with another one in the planning. Argentina is also trying to come to an agreement with Brazil on future nuclear powered boats. 22 Chile is building two new submarines and more are being planned. 23 Both countries are further modernizing their fleets through the purchase of new frigates, attack missile craft and midget submarines. Brazil also has a strong modernization program with two new submarines and four frigates being built. 24

A final consideration is the requirement for free passage by nuclear armed and powered vessels. The Antarctic Treaty while prohibiting nuclear explosive devises is vague on the operation of vessels of this type below 60° south latitude. Based on recent problems in New Zealand and Japan (both consultive parties and, in the case of New Zealand, a sovereignty claimant) over port visits by U.S. Navy ships, a similar problem could occur in the Antarctic region. 25

CHAPTER IV

OPERATIONAL CONCERNS AND CONSTRAINTS

The potential for military action to protect U.S. national security interests in the Antarctic exists. Operations to gain or regain control of choke points, protect U.S. scientific stations, remove a destabilizing foreign military presence or conduct an evacuation of U.S. citizens (NEO) are all within reason. While conflict in this region may be less likely than others, the extreme harshness of the region and its unique international status would require careful planning for military success. There are a number of operational concerns and constraints that argue against the hasty commitment of a force which may not be prepared and cannot be supported. These concerns and constraints must be taken into consideration and planned for before any operation takes place in the region.

The concerns and constraints that follow are provided as both an argument for the development of contingency plans and as considerations in the planning process. Where possible these operational concerns and constraints are compared with British operations in the Falklands or with conditions in North Norway to emphasize the unique severity of the Antarctic and the urgent requirement for dedicated regional planning.

These concerns and constraints will be discussed in a five phase process that might be used to actually conduct an operation in the region. They include: the decision to commit a military force to the region, selection of an appropriate force, supporting the force, employing the force and maintaining a presence once the conflict is terminated.

The Decision To Commit Forces In The Region

The first operational constraint that would constrain a decision to commit forces is the limited amount of intelligence gathering available in the region. The vastness of the region would make it extremely difficult to identify hostile actions before they were well underway. The only personnel actually in the region on a regular basis are those manning the stations and supporting them. While they might be able to provide some warning, the remoteness of the stations except on the Palmer Peninsula precludes much interaction especially in the winter. To add to this lack of on-hand intelligence, there is little interest at the intelligence agency level. None of these agencies have Antarctic offices and group Antarctic matters under global or international issues.1

The second operational constraint is the actual decision process of the national authorities. Here the rather obscure nature of the region becomes the problem. Because the region is seldom publicized, it is relatively unknown to the general public. National security interests in the region are probably even less known. National leaders will be slow to make a military commitment without widespread public support and this may be hard to find for an area so remote and whose importance is difficult to articulate. The longer a decision is delayed the more difficult it will be to adequately plan, assemble a force and move it to the region in a reasonable time. This virtually guarantees that an opposing force will arrive first and that any U.S. military action will be against a force already in place. Even in instances where national interests are clear and compelling such as the Argentine invasion of the Falklands and the Kuwait Invasion, it is difficult if not impossible to commit military forces over

long distances in a timely fashion. Even in these instances the enemy was in place and had to be forced out. It would be even easier to be surprised in the Antarctic Region, especially by nations such as Chile or Argentina who are in a strategic position to project power into the region. Even with adequate warning and a timely decision, it would be difficult to overcome their geographical advantage.

Selection Of An Appropriate Force

Once a decision is made to commit forces to the region, the designated CINC will be faced with a series of operational concerns and constraints in selecting an appropriate force. Force make-up will be constrained both by the fact that this region is a focus of world-wide environmental concern and because of the acute international sensitivity to any military action in the region. The force will have to be designed to accomplish its mission with as little environmental damage as possible. This will effect the platforms and the weapons to be employed. The force will also have to be kept as small as possible to avoid the perception of a U.S. threat to the interests of the nations not involved in the conflict. A force that does not meet either of these constraints could cause an international outcry and condemnation that could outweigh the benefits of even a successful operation. Chances of keeping the conflict under control would be placed at risk.

The British operation in the Falklands did not face either of these constraints. International interest was limited since only Britain and Argentina had conflicting claims and the preservation of the Falklands environment for scientific or aesthetic purposes is not an international issue. The British were free, therefore, to bring as much force to bear as

they could without fear of outside pressure and small risk of any universal international condemnation. Nor, was the nonmilitarization aspect of the Antarctic Treaty a factor in the Falklands War since all of the fighting tool place north of 60 ° south latitude. 2

The remoteness of the region and the lack of any U.S. bases in the region is another constraint. This lack of support facilities and the possibility that no host nation support may be available requires that the force be as self-sufficient as possible. This in turn suggests that the primary force be of a maritime nature, composed mostly of Navy, Coast Guard and Marine units.

Whether or not to try to form a combined or coalition force for employment in the region will also be a consideration. A force of this type appears to be a good idea until the sensitivity of the claimant nations to their sovereignty claims is considered. A coalition force of U.S. and British units, for example, could be seen by South American nations as an attempt to dominate the region. This could further destabilize the region and turn a minor confrontation into regional war.

The harsh environment of the region provides yet another operational constraint on selecting the components of the force. To survive and fight in the extreme cold of the polar regions requires a great deal of training both for ground forces and naval forces. 3 While many units train for cold weather operations, very few train or exercise at the level necessary to operate in the Antarctic. Of the ground forces only two seem to have the prerequisite experience necessary for this region. The 6th Light Infantry Division in Alaska trains and operates in the Arctic region and has conducted exercises in temperature below -50° F.4 The 4th MEB has the

Northern Norway mission and also conducts operations above the Arctic circle.5 That this provides excellent preparation for operating under harsh conditions is borne out by the outstanding performance of the British Royal Marines in the Falklands who also train above the Arctic Circle in Norway.6 Of these two, the 4th MEB which has amphibious training as well would seem to be the best force for the region.

Selection of naval forces will depend upon what ships are available. Since battle group composition is flexible, there is probably no single group with considerably more cold weather experience than others, although individual ships may have operated extensively in cold weather. This could be an operational concern if the available ships had not had any recent experience in a cold weather environment.

A final force selection constraint will be the requirement for Coast Guard ice breakers. If a naval force must penetrate the pack to accomplish its mission, it will require ice breaker support.7 Even in the summer pack ice remains and while ships can in some instances move through leads, ice breaker support remains necessary.8

Currently the U.S. has only two operational ocean ice breakers with a third expected by 1996. 9 This is in itself a serious constraint considering both Arctic and Antarctic missions. Additionally, it has been demonstrated that due to the rigor of ice breaking operations the ice breakers are subject to mechanical casualties and at least two are required to ensure mission success. 10

The British required no ice breaking support for their operation in the Falklands. Even in the winter only occasional icebergs are found above 50^{O} south latitude. 11

Supporting The Force

There are a number of operational concerns associated with providing logistic support to a force deployed to the Antarctic.

The first is the distance from the East Coast of the U.S. to the region - about 9,000 miles. This is 2,000 miles farther than the distance between Britain and the Falkland Islands. Antarctica is also 2,240 miles from Cape Town, South Africa, 1,600 miles from New Zealand and 1,900 miles from Australia. Its closest neighbor, the southern tip of South America, is about 700 miles away.12

The long distance is further exacerbated by the fact that along the route to the Antarctic there are no advance/intermediate base locations, such as the British had at Ascension Island, under U.S. control. 13 In order to set up an advance base for support of operations in the region, a host nation would have to be found or an advanced base seized. The logical place for establishing a base of support would be in one of the countries that rim the Antarctic or on the Falklands. Deception Island would also serve as a useable advance base. 14 The possibility of using any of these locations would depend on who was involved in the conflict and the willingness of those not involved to support U.S. military action.

One potential location would be Christchurch, New Zealand since the Naval Support Force Antarctica is based there already. This force with its experience in providing logistic support to U.S. scientific stations and its special ski-equipped LC-130's could provide valuable resupply to any on-ground force. 15 However, considering the diplomatic problems concerning U.S. Forces in New Zealand, it would be unwise to count this base as a sure thing in a conflict.

The Falklands would also serve as an excellent advance base with Port Stanley and the new international standard airport the British have built there. 16 While it is unlikely that the British would be on the opposite side of any conflict with the U.S., an international perception of a British/U.S. coalition could further destabilize the region and remove this option.

If an advance base was to be seized, the best choice would be Deception Island because of its good harbor. 17 This island, however, falls in the area of sovereignty claimed by Britain, Argentina and Chile. Its seizure could cause major diplomatic problems and could further escalate any conflict.

Operational constraints to force support are not confined to obtaining an advance base. Any maritime force in this region will also have to depend on at-sea replenishment and, if a landing force was put ashore, logistics support for that force.

At-sea replenishment would be hampered by the extreme wind and sea conditions found in the region. It is not uncommon in this region to experience 60 knot winds and 60 foot seas. 18 Weather problems may require the force to move out of its operating area in order to replenish. The number of support ships required to support a force in so remote an area will also be a constraint. At the height of the conflict in the Falklands the British required a ratio of almost three support ships to each combatant. 19 Although it is unlikely that any U.S. action in the region will be as intense as the Falklands conflict, much of the reason for the large number of support ships was the long distances over which supplies had to be moved. Distances for any Antarctic operation will be even greater.

Support for the landing force would normally be supplied by the maritime force. Depending on how far inland such a force would have to penetrate, this could also be a problem. Support sent ashore by sea might be required to penetrate pack ice which would require ice breaker support. Support flown ashore would face the same weather and climate problems the ships at sea face. Just as the early explores did, supply caches would have to be placed ashore, perhaps by air drop, ahead of any movement off the coast. This could be done by Air Force C-141's much as they currently do in providing supplies to the U.S. stations. 20 The Naval Support Force Antarctic, if able to operate out of an advance base, could also be used to resupply troops ashore.

Even in this abbreviated look at support problems for a force deployed to Antarctica, it is clear that advance planning for host nation support or advance base use could be the critical element in the success of the force. Prepositioning of supplies such as is done in North Norway is not an option since that would violate the nonmilitarization clause of the Antarctic Treaty. The supply situation is even more severe than what the British faced due to the longer distances, harsher environment and lack of a U.S. controlled location for a support base.

Employing The Force

Regardless of the type of mission, the employment of a maritime force in this region will face severe operational constraints. The worst of the operational constraints will be generated by the geography, the climate and the weather of the region. Captain Robert Scott, a British explorer, who

died in his quest to be the first man to the South Pole gave a grim but accurate first hand description:

> "We see only a few miles of ruffled snow bounded by a vague wavy horizon, but we know that beyond that horizon are hundreds or even thousands of miles which can offer no change to the weary eye....One knows there is neither tree, nor shrub, nor any living thing, not even inanimate rock-nothing but this terrible limitless expanse of snow. It has been so for countless years, and it will be so for countless more. And we, little human insects, have started to crawl over this awful desert.... Could anything be more terrible than this silent, wind-swept immensity...?"21

One of the severest geographical constraints of the region is the ice. With only small exceptions the entire continent is covered by ice. This ice is constantly moving and where it crosses the edge of the continent it forms ice shelves. The edge of these ice shelves form vertical barriers which average 60 meters above the sea making about 40% of the coastline virtually inaccessible for amphibious landings.22 A second barrier is formed by the annual or pack ice. In the winter months this pack may extend 500 miles out from the coast. 23 Penetrating this pack is a major operational constraint requiring the use of ice breakers even in the summer months. Although the pack can be penetrated in the summer through open leads, the constant movement of the pack requires ice breaker support to ensure ships are not trapped by the shifting ice. Following an icebreaker also increases the vulnerability of ships to attack by submarines operating under the ice since it precludes dispersion and maneuvering. Icebergs also provide a navigational hazard even in open waters. These icebergs can be immense and widely dispersed. In 1987 an iceberg that was 160 kilometers long broke from the Ross Ice Shelf. 24

Exposed beaches for amphibious landings are extremely rare and all are rock covered. Most of these beaches are found either on the surrounding islands or on the Palmer Peninsula. Landing on these beaches is complicated by the piling up of wind-blown ice floes and strong surf. The best available landing sites on the remainder of the continent are frozen bays. Where the ice is thick enough, ships can be moved alongside the ice and unloaded. 25 These conditions reduce the options for landing sites and may require a landing some distance from the objective.

Movement to that objective, an inland scientific station for example, also faces operational constraints. Trafficability on the continent is poor due to large crevasses that are formed as the ice moves toward the sea. These can be even more hazardous when they are bridged over by snow and are invisible. If movement into the deep interior was required, problems with high altitude sickness will be a problem. Antarctica is the world's highest continent. It has an average elevation of 1830 meters while 55% of the continent lies at 3000 meters or more in height. 26 Marines training at the Mountain Warfare Training Center in California frequently suffer from high altitude sickness at comparable elevations.27

Clearly the first force ashore will enjoy significant advantages due to the difficulties mentioned above. It is unlikely that U.S. forces would ever be first ashore due to political considerations. A forced entry capability would be a requirement in the case of even limited opposition.

Two other geographic oriented operational constraints are problems with navigation due to the magnetic influence of the pole and communications difficulties due to high latitude radio blackouts and difficult satellite access.28 While it would seem that these more

technical constraints could be overcome by repositioning of GPS and communications satellites, prior planning would be required to de-conflict worldwide requirements.

It is important to note that the British faced few of these problems in their conflict in the Falklands. These was no ice pack to deal with and they had several choices for landing sites. They did face trafficability problems moving across the islands, but nothing as severe as exists in Antarctica. Setting aside all other environmental comparisons, the geography of the Antarctic region along poses much greater constraints than those faced by the British.

A second major operational constraint is the severe climate of the Antarctic Region. Antarctica is the coldest place on earth. At equivalent latitudes it averages 30° F colder than the Arctic. Average temperatures at the North Pole range from -13° F to -30° F, at the South Pole the range is from -13 °F to -80 °F. 29 Temperatures of -100° F are not uncommon on the Antarctic Plateau. 30 This extreme cold places tremendous demands on both men and equipment. Not only must a force be able to fight the enemy, it must be able to survive. Only forces that have received extensive cold weather training prior to be deployed will be able to effectively fight in this region. The stress placed on both men and equipment must be planned for well in advance. Some of the general effects of extreme cold that will effect the conduct of operations both at sea and ashore are listed below:

1. Cold weather icing of both ships and aircraft. This can prevent or delay operations that may be vital to the success or even the survival of the force. 31

2. Cold weather injuries can deplete a force to the point where it can no longer complete its mission.
3. Cold weather will reduce personnel efficiency and slow down routine operations.
4. Cold weather will cause an increased number of weapon and equipment failures due to brittleness, condensation, battery failure, and the freezing of lubricants and moving parts.
5. Communications can be disrupted if radios are exposed to the cold and freeze.

While this is just a partial list, it provides examples of how operations can be slowed down or totally disrupted by cold weather. In Antarctica where the temperature stays below freezing over 95% of the continent, cold weather is a larger constraint than in any other region. 32

The other major constraint in employing a force in this region is the weather. As well as the coldest, Antarctica has also been called "the stormiest place on the earth." A number of semi-permanent lows around the region generate ferocious storms often with very little notice. These storms can contain strong cyclonic winds, rain, lightning, and snow. A second kind of wind storm present in Antarctica is surface or katabatic. This wind storm is gravity generated, originates on the ice cap and flows down toward the sea. It is responsible for the gales that come down the valleys of the costal mountains. When the katabatic and the cyclonic winds come together along the coasts the strongest winds occur. These winds often generate wind chill factors of over -100 ^{o}C. Gusts of up to 225 miles-per-hour have been recorded in the Commonwealth Bay area. 33

The suddenness of these storms could play havoc with any operational time table. This has a major impact on amphibious or air landed assaults that rely on precise timing for their success. In 1947, Australian Navy Commander G.F. Dixon was tasked to land a party of scientists on Heard Island. He stood off the island for 18 days and in that time had only 22 hours that were suitable for sending supplies and personnel ashore. 34 These storms will make much more difficult any air operations either in support of task force or a landing party. As mentioned in the section on suppling the task force, a landing party may have to go for extended periods of time without support. This places constraints on the objectives that can be assigned to such a force since the risk of leaving them stranded is always present.

The storms and strong winds also generate some of the largest waves and roughest water anywhere. These turbulent seas impact flight deck operations, cause engineering casualties and may present underway replenishment or amphibious operations. This also places constraints on any search and rescue missions that may be required.

Visibility is another weather-related constraint that impacts operations most strongly in this region. The region is susceptible to "white-outs" - a condition that occurs when diffused light does not cast shadows on the surface of the snow. The lack of surface definition has an effect on depth perception and makes flying hazardous to the extreme. Additionally, the wind can create a condition of blowing snow similar to fog that produces zero visibility once wind velocity reaches 15-18 knots. These conditions are not uncommon since the average wind velocity in Antarctica is 48 miles-per-hour - the highest in the world. 35

Weather, like climate and geography, is a significant planning factor for any operation in the Antarctic Region. Its sudden changes and fierceness require any plan to be flexible and as little dependent on preciseness as possible. It also requires planning and incorporating alternate means for accomplishing the task force's mission.

British forces faced few of the same weather problems in their Falklands operation. British pilots did face white-out conditions and storms, and their ground troops did endure cold, wet weather. However, there is no indication that weather significantly disrupted the timing of their amphibious operations or their task force operations. 36 It is unlikely that a task force deployed below 60^{o} south would be as fortunate and adequate planning to account for the prevailing weather conditions would be essential.

Post-Conflict Requirements

From a military perspective it would be best to withdraw U.S. forces from the region as soon as possible due to the difficult support and operational conditions existing there. While operationally this would be the preferred course of action, it may not be possible. After the Falklands War the British decided that they had to continue to defend the islands against further attack. To do this they have left a garrison of troops and have enlarged the airport to international standards at a high cost. 37 The U.S. could find itself with the same requirement except in a far harsher environment. The U.S. could also find itself under strong international pressure to withdraw so the region could be returned to its nonmilitarized status. This international pressure could come in the form of denial of landing rights or use of ports previously given, further

complicating the logistic support of any U.S. military presence and the scientific stations as well. Additionally, few nations are going to see any U.S. military presence in the region in their best national interests. This has not been a problem for the British since all of their garrisons are above 60° south latitude and not subject to the restrictions of the Antarctic Treaty. Operations that require any continued presence below 60° south latitude may require the U.S. to "go it alone."

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

This examination of the Antarctic has shown that there are many U.S. national security interests directly and indirectly linked to the region. U.S. interests are also closely linked to the other countries that are involved in the region, especially those that are consultive parties in the Antarctic Treaty.

It is clear that the Antarctic Treaty has served the interests of the United States during the last 30 years and has allowed the United States to exert strong influence in the management of the region. Certainly one reason this is true is that the Treaty has also served the national interests of the other countries involved in the region. The Treaty has worked by consensus and since the national interests of the Treaty nations have been mostly identical, there has been little disagreement or conflict.

The threat to this state of affairs, however, is increasing. Pressure from the international community to either close the Antarctic to exploitation forever or share equally any exploitable resources may cause those nations claiming sovereignty to react in some way that forces a confrontation. This would seem to be particularly true of Argentina and Chile who consider the Antarctic an extension of national borders. Conflict in this region over a question of sovereignty has a precedent in the Falklands War.

As world resources continue to shrink and if Antarctica proves to be a usable source of natural resources, competition over the region between the developed nations and the emerging nations will intensify. It is

conceivable, with the proliferation of arms throughout the world, that this competition could resort in some type of conflict in the region. The vulnerability of commercial shipping to forces operating out of the Antarctic was proven during World War II. Certainly the geography and climate of the region would strongly favor any force that had specifically planned and trained to operate there and had established some sort of support base.

Here in lies the compelling need for deliberate planning for this region. The operational concerns and constraints discussed in this paper present large but not unsolvable problems. A carefully crafted contingency plan would go a long way to ensuring successful operations in the region. Since reaction time may be short and given the potential for hesitation in committing forces, a plan "on the shelf" would allow a quicker assembly of appropriate forces and greatly enhance the support and employment of these forces once committed. Since the extreme environment and special operational requirements preclude the use of an "ad hoc" force, advance planning would be essential for effective intervention in this region. A force committed without regard for the operational factors of the region could find itself defeated by the environment before it ever closed with the enemy.

Recommendations

In order to enhance the operational effectiveness of U.S. forces committed in the region in support of U.S. national security interests, the following recommendations are provided:

1. Assign the Antarctic Region to one of the maritime CINC's as part of their area of responsibility. In the current organization it appears the Atlantic Command would be the best choice.

2. Require the U.S. CINCLANT staff to develop contingency plans for operations in the region with a focus on control of the sea lines of communications and limited amphibious operations on the Antarctic continent or the surrounding islands.
3. Designate one organization as the Antarctic Contingency Force. If CINCLANT is the designated CINC then the 4th MEB, because of its Norway mission, is the best choice. If CINCPAC is the designated CINC then some or all of the 6th Infantry Division stationed in Alaska would be the best choice. These units regularly engage in cold weather training and exercises and would require the least preparation for operations in the Antarctic. The MEB has the advantage of also being trained in amphibious operations.
4. While it does not seem practical to designate any specific naval forces as an Antarctic Contingency Force, fleet operations in both the North Atlantic and North Pacific should be undertaken as often as possible.
5. Conduct a survey to determine the best advance support base locations, their capabilities and the political problems involved in using them to conduct operations in the Antarctic.
6. Maintain a strong scientific presence in the region to demonstrate the continuing interest of the U.S. in the region and to discourage any adventurism in the region.
7. Continue to exercise the right to unannounced inspections of other nation's stations. This could provide some early warning of a nation's increased military interest or presence in the region.

8. Do not schedule or conduct military training exercises in the region. While this would provide the best preparation for the forces, it would be seen as destabilizing and provocative by other nations. It would unhinge Antarctic Treaty and effectively destroy nonmilitarization in the region. As stated previously, maintenance of the Treaty System is in the best security interests of the U.S.

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